

### REMARKS

The Applicant wishes to thank Examiner Martir and Examiner Fuller for the telephone interview of April 29, 2001 and has carefully reviewed the Final Office Action dated December 3, 2001. As suggested, the Applicant has prepared the following response.

**The rejection of Claims 1 - 11 as being rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention is respectfully traversed.**

The Examiner has taken the position that Claims 1 and 9, do not clearly indicate how the method disclosed reduces the tensile stress in the surface of a part.

The Applicant respectfully submits that as taught in the subject specification, by decreasing the magnitude of compression in the direction towards the boundaries of the selected region will result in the reduction or elimination of high tensile stress zones along the boundaries of the selected region. As stated on page 14, lines 6 through 26:

"In addition, it is known that introducing a region of high compressive residual stress requires tensile stresses to exist elsewhere in the part to achieve equilibrium. Unfortunately, sharp surface demarcation or discontinuities typically exists along the boundaries of the burnished area and, depending upon the geometry and stress field, tensile residual stress zones or concentrations often form along such boundaries. Such stress zones can significantly reduce the fatigue life of a part. It has been found that gradually reducing the pressure being exerted by the burnishing member to reduce the magnitude of compression in the direction towards the boundaries ("feathering") will reduce the build up of such tensile residual stress. Further, it has been found that by controlling the compressive residual stress distribution and the magnitude of compression, the tensile stress distributions within a part may be offset or distributed in such a manner as to optimize the fatigue and/or stress corrosion performance of the part. By controlling the pattern of burnishing, such as the density of burnishing, and by gradually reducing the magnitude of compression near the boundaries of the regions being burnished ('feathering'), the tensile stress zones which occur immediately adjacent and parallel to the boundaries of the regions being

treated may be reduced or eliminated."

Accordingly, the specification clearly teaches how the method of independent Claim 1 and the method of independent Claim 11 reducing zones of high tensile stress in the surface of a part.

In view of the foregoing, the Applicant respectfully submits that the rejection of Claims 1 - 11 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention should be withdrawn.

**The rejection of Claims 1 - 11 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,826,453 to Prevey, III is respectfully traversed.**

The Examiner takes the position that independent Claims 1 and 9, as well as all dependent claims, are anticipated by Prevey, III. Referring to Claim 1, the Examiner appears to take the position that Claim 1 discloses a pressure applied such that the magnitude of compression decreases in the direction towards the boundaries of the selected region is inherently disclosed in Col. 8, lines 57 - 59, since the zones of deformation is formed by compressions of different magnitudes that are exerted over the surface in a selected pattern.

The Applicant submits that Col. 8, lines 57 - 59 of Prevey states:

"Performing a burnishing operation to produce a zone of deformation for inducing a deep layer of compression within the surface of the workpiece having associated cold working of less than about 3.5 percent."

The Applicant submits that he is unable to find where this teaches or discloses the claimed invention.

When a reference does not expressly recite or disclose a claimed invention, but following the disclosure necessarily produces the claimed subject matter, the reference inherently anticipates under Section 102. However, in order for this to be so, following the reference teaching must **inevitably produce the claimed subject matter**. The Applicant respectfully submits that independent Claims 1 and 9, requires "a pressure being applied such that the magnitude of compression decreases in the direction towards the boundaries of the selected region" (Claim 1) or "a density of burnishing and the magnitude of compression are varied to reduce the high tensile stress zones along the boundaries of the selected region" (Claim 9). In contrast, the method disclosed in Prevey III, *permits* a process whereby pressure may increase, decrease, or stay the same in the direction towards the boundaries of the selected region and **does not require** that the density and/or direction of burnishing and the magnitude of compression be varied to reduce the high tensile stress zones along the boundaries of the selected region. Indeed, there **must be a selection process** to arrive at the *right* process for achieving the desired result. Accordingly, the results of the claimed method, i.e. that of minimizing "the effects of any tensile stress zones near the boundaries" (Claim 1) or reducing "the high tensile stress zones along the boundaries of the selected region" **are not inevitable** and are therefore **not inherent** in the method taught in Prevey III. Accordingly Claims 1 - 11 of the subject application is not anticipated by the cited reference.

Claim 7 provides that the "burnishing operation includes varying the burnishing density along the boundaries of the selected region." It appears that the Examiner takes the position that Claim 7 is anticipated by Col. 2, lines 57 - 60 of Prevey. Col. 2, lines 57 - 60 of Prevey states:

"The burnishing apparatus is then passed in a predetermined pattern across the area to be burnished such that the zones of deformation formed by each pass of the burnishing apparatus do not overlap."

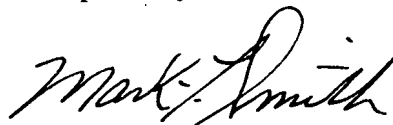
The Applicant respectfully submits that such teaching of Prevey does not teach or disclose the benefits of varying the burnishing density along the boundaries of the selected region. Accordingly, it does not anticipate the claimed invention.

In view of the foregoing, the rejection of Claims 1 - 11 as being rejected under 35 U.S.C. 102(b) as being anticipated by Prevey, III should be withdrawn.

**Conclusion:**

In view of the foregoing amendments and remarks, it is respectfully submitted that all of the Claims now pending are allowable over the art of record. Reconsideration of all claims now in this application is respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Mark F. Smith". The signature is fluid and cursive, with the first name "Mark" and last name "Smith" clearly distinguishable.

Mark F. Smith  
Attorney of Record  
(Reg. No. 32,437)

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***Smith, Gutttag, Hasse & Nesbitt Ltd***  
7577 Central Park Boulevard, Ste. 316  
Mason, Ohio 45040  
(513) 229-0383 (Phone)  
(513) 229-0683 (Fax)  
patlaw@aol.com (Email)